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ABSTRACT

The document describes in detail the Institute of Agricultural Technology (ITA), established by the Algerian government in 1969 at Mostaganem to train agricultural engineers, and its innovative four year training program. An introduction provides background information and quotes from the governmental guide regarding the Institute. Following chapters include: (1) The ITA--Inception and Organization, outlining training objectives, job priorities, staff, trainee recruitment and characteristics; (2) Outline of Training, examining the four main sections of character development, basic training, specialized training, and training in economics; (3) Training Organization and Teaching Equipment, describing training stages, assessment of knowledge, and teaching materials, audiovisual aids, laboratories, and workshops; (4) Field Training and its Role in the ITA Training System, describing adaptation, common core, third-year, and fourth-year field course categories. Conclusions summarize successful recruitment and teaching methods, problems encountered due to large training quotas, and proposed program changes. The development of the four year training program for agricultural engineers is seen as being closely linked with Algeria's development as a nation. (LH)

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Experiments and innovations in education No. 19
An International Bureau of Education series

Mostaganem Institute of Agricultural Technology: an educational innovation

by Noureddine Boukli
and Institute Staff

Study prepared for the
International Educational
Reporting Service

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Preface

This study takes the 'Experiments and innovations in education' series into a new field, that of agricultural engineers' training in a country which has given priority to agrarian reform. It was in 1969 that Algeria, as part of its national development effort launched what became known as its Agrarian Revolution. The setting up of an Institute of Agricultural Technology at Mostaganem to supply the need for highly skilled agricultural personnel played an essential part in this effort. The profoundly innovatory character of the engineers' training, both from the point of view of the spirit underlying it and from that of its organization, justifies the inclusion of this study in the present IERS series. It is interesting to note that the project has already been made the subject of a series of slides accompanied by a cassette-recorded commentary, and also of a film.

The Secretariat wishes to express its gratitude to Mr. Noureddine Boukli, Secretary-General of the Ministry of Agriculture and of the Agrarian Reform of the Democratic and Popular Republic of Algeria, who with the collaboration of the staff of the ITA at Mostaganem, gathered the material for this monograph. The points of view expressed in it are not necessarily those of Unesco. The data and facts are, moreover, to be found in a far more detialed publication[1] of which the ITA has produced a limited number of copies which it will have pleasure in sending to any reader on request.

1. République algérienne démocratique et populaire. Ministère de l'agriculture et de la réforme agraire. Direction de l'enseignement agricole. Institut de technologie agricole de Mostaganem. *La novation pédagogique: données quantifiées, fait pédagogiques*. Mostaganem, 1974. 403 p., figs., tables.

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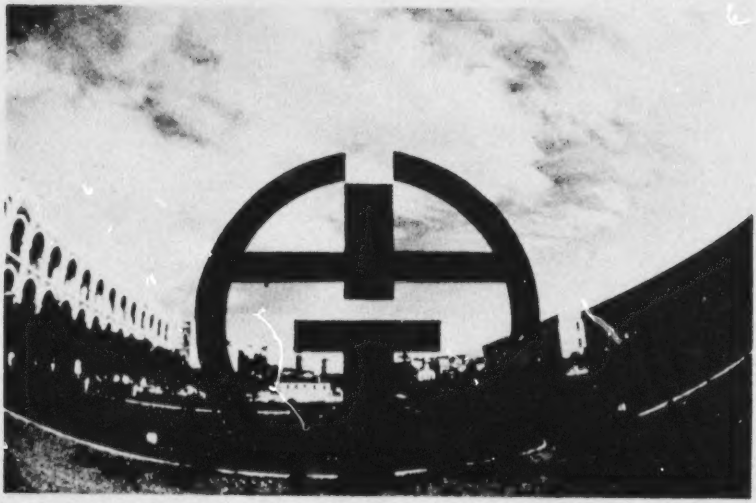

The Mostaganem Institute of Agricultural Technology

Introduction

In Algeria, the training of agricultural engineers is now the responsibility of the Institute of Agricultural Technology (ITA) recently set up at Mostaganem. The training provided there is novel in many respects, and the purpose of this study is to highlight its innovative aspects.

The ITA was set up under an over-all policy to develop Algeria's agricultural sector. The various aspects of this policy and its impact on the training of high-level personnel for this branch of the country's economy can best be understood by referring to the 'Guide to the training of agricultural engineers' issued on 5 May 1969 by the General Secretariat of the Ministry of Agriculture and Land Reform. Extracts are reproduced below. The main headings are:

- the general situation of Algerian agriculture;
- pre-requisites to its development;
- trainee recruitment;
- the diploma, and career opportunities;
- career adaptation.

General situation of Algerian agriculture

'Since 1962, agricultural production has been in the hands of either workers on self-managed farms, those of former *Moujahidin* co-operatives or *fellahin*, helped by the tireless dedication of far too few technicians who are in any case snowed under with administrative tasks. In this seven-year period, agriculture has continued to produce; it has been managed but not developed.'

'In planning the country's development, higher priority was indeed given to other objectives such as organizing a national civil service, educating the young and setting up basic industries.'

'Since independence, however, Algeria's population has risen by 3.2 per cent each year. We must therefore modernize our agricultural sector in order to feed this population, and improve the living standards of agricultural workers by providing them with satisfactory employment. Every effort should be made to preserve

our land resources and to achieve an economic balance by developing the country's home markets. The success of the basic industries, which will involve the entire agricultural sector, will depend partly on outlets on the home markets.'

'Directing our development effort towards agriculture, as we are now doing, is a decisive step forward in building the country's future.'

'We hope, moreover, that this experiment will help other countries with similar development problems.'

Pre-requisites to agricultural development

According to the Guide, effective development of Algerian agriculture must stem from three measures: 'setting up institutions to train skilled personnel up to several levels and on a massive scale'; 'developing publicity and extension services to convince present workers to accept this personnel'; 'developing collaboration within the various co-operative and socialist structures of production, processing and marketing.'

Under this general policy several measures have already been implemented or are currently being worked out. For instance, 'increasing facilities for training specialists and skilled farm workers'; 'trebling enrolment at regional agricultural schools'; 'an intensive publicity campaign on the need for agricultural progress'; 'setting up an institute of agricultural technology.'

'This institute is expected to train, over a four-year period, engineers to be immediately operational in the various specializations needed for a modernized agricultural sector.'

'The institute is scheduled to open in the 1969-1970 academic year. The first batch of 500-800 trainee engineers is expected to graduate in 1972.'

'In this way, ten years after independence and thanks to the concerted efforts of its people, Algeria will be on the way to having all the skilled personnel it needs, in terms of both quantity and quality, to make agriculture a modern profession consistent with the needs and aspirations of the Algerian people.'

Trainee recruitment

The task of ITA, then, is to train agricultural engineers in four years. The number of trainees admitted each year is to be based on studies and surveys of the high-level personnel needed for agricultural development. This number may have to be increased as more

progress is achieved, and it may prove necessary to set up additional, similar institutes. On graduation, trainees will have civil servant status and they will be paid a stipend during training. It is therefore up to the institute to ensure that jobs and promotion await them. Graduate engineers will be expected to work as 'development agents' and 'pioneers in agricultural development.' Applicants should therefore be 'volunteers, aware of the importance of their future profession to the country, and they must be at an educational level entitling them to enter higher education.' In view of this, entrance requirements should not be based solely on a diploma (a baccalaureate or technical diploma) but also on the applicant's personality. Such requirements must be widely publicized in all secondary and vocational schools.

Training programmes

'Training given at the institute shall be comprehensive, in keeping with farming conditions, and geared to actual work in the field. It must, therefore, be specialized.'

The institute's terms of reference, based on the foregoing definition, are: 'to train engineers to be immediately operational' and 'to train them in such a way that they may adapt, through refresher training at regular intervals, to future developments in agriculture.'

Training is both theoretical and practical. In the fourth (final) year, it is wholly vocational and carried out entirely in the field. In the first year, it is planned as an introductory and methodology course, and brings trainees up to a level where they can study agriculture in general as well as in its special aspects which are covered later in the curriculum. In the subsequent two years, training is more technical and trainees choose their specialization at the end of the second year. The fourth year is spent outside the institute entirely, and trainee engineers work on a number of field projects in which they apply the skills acquired and are required to show initiative.

The purpose of the institute is not confined to training agricultural engineers but also 'to providing facilities for refresher training to all civil servants in the agricultural sector. From its inception, courses and lectures will be open to all members of the public who wish to avail themselves of them.'

Throughout their training trainees are expected to 'keep in mind reality and their responsibilities.' They must therefore be

able to benefit from a 'sound training in scientific and technical skills' as well as to develop 'initiative, ability to work in a team and to teach others'. To this end, trainees are divided into small groups and 'everything possible is done to help trainees to train themselves'. However, 'the greatest importance will be attached to their psychological, intellectual and physical development through organized games, leisure and study trips. They shall also be helped to benefit from the experience of Algerian and world-renowned experts in agriculture and development planning'.

The diploma and job assignments

Requirements for obtaining the agricultural engineer's diploma are of course in line with the training objectives outlined above.

Throughout the four years spent at the institute 'progress will be checked at regular intervals'.

At the end of the final year, which is devoted to field work, 'an engineer's diploma shall be awarded on the basis of a memorandum written by the trainee and expounded by him before a board of examiners which shall include members from outside the teaching profession'.

Diploma-holders are 'guaranteed a wide choice of career opportunities, in the public and semi-public sectors, in research, teaching, farming, agricultural upstream and downstream industries, and marketing organizations.

Career adaptation

The Guide says that 'adaptation to the productive sector by newly-trained engineers and other skilled workers graduating from regional schools of agriculture is bound to create problems to which we are already giving attention'.

Throughout their four years' training and their practical year, trainee engineers have opportunities to become acquainted with a great many *fellahin* and farm workers. In addition, they will have attended 'compulsory courses on the psychological and social background of the Maghreb region's agricultural workers'. They will thus be well equipped 'to understand these people, which is essential to the success of the operation'.

'With regard to present agricultural workers, we must use all the resources of our imagination and those of our civil service to arouse in them a desire for progress so that the large batches of high-level personnel who will graduate from 1972 onwards should be

eagerly awaited by *fellahin* and workers.'

In conclusion, the Guide says that 'Algerian agriculture will be taking a decisive turn in the coming decade. The Institute of Agricultural Technology at Mostaganem, which is the cornerstone of the new policy, should be the point of convergence for these aspirations, and of departure for a new, dynamic venture'.

The ITA's tasks and the type of engineer it is expected to produce are thus clearly defined in the Guide. Now that the ITA has been functioning for several years, the extent to which objectives have been met can be appraised in such a way as to highlight the innovatory nature of its training methods.

To do this, the ensuing text deliberately departs from the Guide's structure and divides the information available into four chapters:

1. The ITA at Mostaganem - inception and organization;
2. Outline and content of training programmes;
3. Organization of training and teaching equipment;
4. Organization of field training.

The conclusion provides an opportunity to describe the extent to which the ITA at Mostaganem, as at present structured, has fulfilled the objectives assigned to it. In the light of experience gained, consideration might be given to improvements as regards both structure and functioning.

I. The ITA — inception and organization

The ITA was set up by government order No. 69-82 of 15 October 1969. Other institutes of technology were set up a few months later (by order No. 69-106 of 26 December 1969). Such decisions were taken with a view to fulfilling the objectives of the four-year Plan, which provided for the training of the high-level personnel needed for Algeria's development.

Target figures for such personnel - to be achieved by 1980, were laid down in 1970 as follows:

500 class 6 engineers;
6,000-7,000 engineers and others in class 5;
15,000-17,000 technicians and others in class 4;
30,000-35,000 class 3 technicians;
70,000-80,000 class 2 skilled workers.

The Mostaganem ITA is expected to train the 6,000-7,000 class 5 personnel, who are described as 'engineers/development agents'. To meet this objective, the number of entrants to be admitted had to be steadily increased and rose from 350 in 1969 to 1,000 in 1973. It is already becoming clear that the ITA on its own cannot train the total number of engineers required, and plans are under way for a second ITA at Guelma.

In the section of the 1970-1973 four-year Plan entitled 'meeting the needs of the economy', recommendations are made for setting up institutes of technology as part of an over-all policy described as follows:

'An essential undertaking, to meet the needs of the economy for trained men, is to set up institute of technology... Such institutes should be run on the basis of the following three main principles:

first principle: intensive training;
second principle: innovation in training;
third principle: the urgent need for training.

The training objectives of the institutes of technology are linked to the country's development targets. The training is organized along the lines of "on-the-job training", and is based on surveys of jobs from which the necessary theoretical training can be derived.'

The Plan provides for improvement in the agricultural sector through the reorganization of production and increased yields. The foreword to the report on the agricultural sector, says that 'the training programme for high-level personnel (like the long-term objectives of the agrarian reform) will produce results in the agricultural sector in the long term and is intended gradually to do away with the sector's dual nature, split as it is into a modern sector and a traditional one. The ultimate objective is a single, modern agricultural sector closely linked to the other branches of the country's economy'.

From this statement of the objectives to be achieved, it follows that institute of technology are required to train workers who will be immediately operational in the jobs awaiting them. The institutes therefore admit trainee engineers with no prior requirement of a diploma, and the trainees' future assignments are decided on the basis of identified job priorities. In the case of the Mostaganem ITA, four main priorities, dictated the job assignments of the first four batches of graduates.

1. Employment as instructors, to help complete the 'algerianization' of all agricultural training staff by the beginning of the third five-year Plan (terminating 1977). The ITA and ITMAs (*Instituts de technologie moyens agricoles* or medium-level institutes of agricultural technology) together cover this need. Between 1974 and 1977, 45 per cent of the engineers trained at the ITA are expected to work as instructors.

2. Employment as project or research engineers, to bring existing project teams up to the required total. The ultimate objective is an integrated system of supervision, training, extension work and research.

3. Employment as specialists to work at the local production level under *Commissariats de développement rural* (CDR) (local rural development authorities), in multi-disciplinary teams at each CDR. The objective here is extensive supervision in all branches of production.

4. Employment as administrators, to help the over-all development of Algeria's agriculture, under the supervision of *Directions agricoles de Daïra* (DAD) (agricultural directorates of the *daïras* or districts). They too form multi-disciplinary teams consisting of specialists in at least one of the following: agriculture, animal husbandry, agricultural machinery, land utilization and forestry.

Six main engineering specializations have thus been selected to meet the country's agricultural requirements. One of these, multi-crop farming, is itself sub-divided into three sections: rotating crops, market gardening and perennial crops.

1. ORGANIZATION OF INSTITUTES OF TECHNOLOGY

Organization is, of course, based on the objectives outlined above. The institutes are not responsible to the higher education authorities but come under the various ministries concerned with the country's main economic sectors. The institutes are therefore administrative institutions; each one has its own governing board.

The permanent staff at the ITA consists of three categories: 160 instructors, in direct contact with the trainees; 70 'educational support' staff who ensure the smooth running of the various departments; 440 administrative staff.

Since the four-year groups amount to 2,400 trainees, the ratio of staff to trainees is one to ten, but varies according to subjects. It is higher for the first two years of the common core and lower for those fourth-year trainees undergoing pre-vocational training.

Terms of employment of the Institute's staff vary considerably. The teaching staff includes some permanent civil servants and persons under fixed-term contracts with the government. It also includes military service volunteers, foreign technical assistance experts, French citizens who have volunteered to teach at the Institute in lieu of military service, and instructors trained at the ITA.

2. TRAINEE RECRUITMENT

In view of the urgent need for trainees, a novel recruitment method has been devised, based on developing awareness among secondary school pupils. Four media are used for this purpose: the press (advertisements in two newspapers); posters put up in lycées, regional schools and public places (2,000 posters); the radio

(short information broadcasts); 'publicity campaigns' in lycées (50 lycées visited).

Visits to lycées are carried out by teams of two according to a carefully worked out plan, which consists of: a lecture to pupils in the terminal classes, with the help of slides depicting life at the ITA; talks with the school administrative, teaching and careers guidance staff on conditions for the entrance examination; distribution of literature, viz., an information leaflet on the ITA, entry forms for the examination, trainee-engineers' contracts.

These methods have produced results. In 1973, 2,100 applicants sat for the entrance examination, and half that number were admitted as first-year trainees. Most applicants (97 per cent) were men; half of the entrants were aged 20-21. Two-thirds came from lycées, 90 per cent of them with a scientific background. They sat for the examination at the end of one or the other of the two terminal classes. Of the remaining applicants, nearly all came from regional schools, and only 3 per cent of them had already worked in agriculture in some technical capacity.

The following points emerged from a survey carried out in 1970 on applicants' motivation in sitting for the examination. The main reasons given for choosing the ITA and a career in agriculture were, in descending order of importance: a wish to undergo higher education; attraction towards farming; opportunities, prospects; teaching methods; financial advantages; avoiding repetition of present class; desire for a specialized training.

On entering the Institute, 80 per cent of the trainees stated that they had already made up their minds on their future specialization. Admission is conditional on all trainees undertaking to work for the Ministries of Agriculture and of Land Reform for a period of ten years.

The foregoing outline of the organization of the ITA and of its trainees' backgrounds and profiles should make for better understanding of the training as such, described in the next section.

II. Outline of training

Generally speaking, the training objectives of the institutes of technology are geared to the objectives of the country's development planning. In the case of the ITA, the programmes have been worked out in line with a profile and behaviour pattern which might be expected of graduates of this institution. In a note dated February 1972, the Director of studies of the ITA describes four main aspects of this behaviour pattern.

1. A graduate engineer is expected to act as an 'agricultural development agent. This means that he should be equipped to modify present production structures and help to institute new ones'. This action should not be regarded as the special privilege of ITA-trained engineers or if it is, it should not remain so. As a development agent he will work as a member of a group which will include *fellahin*, farm labourers and others. It is the group as a whole which has all the information needed to 'find the equation' of a problem, which acts and makes changes.
2. The engineer should be a specialist, which means that he should be well versed in the techniques of his specialization and be able to adapt them to increasingly complex situations.
3. He should be 'adaptable', that is, able to apply his scientific skills to tasks outside the field of his specialization.
4. Finally, he should be 'able to work as a member of a multi-disciplinary and multi-level team.'

On the basis of the above profile of future engineers, training has been divided into four main sections: character development, with its implications for the communal life at the ITA; basic training in scientific and technical subjects; specialized training, including instructor-training; training in economics. We shall now see how this works out in practice.

1. CHARACTER DEVELOPMENT

This consists of theoretical and practical training on mankind in general, its organizations and institutions. The aim is to help the engineer in the social role he will have to play as development agent. Theoretical training includes sociology in the first two years of the common core, plus economics and management techniques (see section 4 on training in economics below). Practical training is based on trainees' active participation in running the Institute, where they spend four years altogether.

Sociology

Training in this subject takes up about 7 per cent of the total time devoted to theoretical training. Lectures are supplemented by some 20 days' field work per year. The sociology training given in the second year at the ITA may be taken as an example.

The objectives of every stage of training at the Institute are defined in common core objectives cards. The aim of sociology training in particular is stated as follows: 'the engineer should be able to analyse the social implications of a problem in an agricultural situation and to see that situation within the context of over-all development'. From this are derived two sub-objectives, 'to show that managing land resources is subject not only to constraints but also to decisions'; 'to analyse the human problems involved in the introduction and development of livestock-raising in self-managed farms'.

Courses consist of sessions covering the following phases:

- reading and analysing a paper;
- viewing a television programme illustrating the case being examined;
- an exercise, carried out by trainees individually or in groups of three and aimed at: (a) assessing the extent to which they have understood and assimilated the content of the paper (using a multiple-choice questionnaire); (b) encouraging reflection on experience gained in field work (through series of open-ended questions).

These exercises are not corrected individually. Trainees are given correct solutions in writing, and may receive further information over the internal broadcasting system or by means of another television broadcast.

In the first year of the common core, trainees attend three field courses aimed respectively at: (a) explaining decision-making on the basis of information obtained through an interview; (b) assessing the problems of cattle-raising, the reactions of farmers to its introduction, and the human and technical consequences thereof; and (c) conducting a social study of a cattle-ranch, based on the workers' level of knowledge and training, and the extent to which they participate in management.

Trainee engineers are assigned to livestock farms in groups of three and provided with a written guideline. Each group is expected: to collect data through interviews or by consulting reference material; to process these data; to prepare analyses; to write a report.

Sociology training is given to batches of 100 trainees. The instructors' tasks include: establishing a work schedule; co-ordinating with teams of instructors in other subjects (this is essential, since the training covers several subjects); locating and processing reference material; preparing television programmes; and correcting exercises and reports.

The number of instructors appears to be inadequate for the proper supervision of trainees, who are scattered over 24 lecture rooms and over some 100 farms in the field. Trainees' progress is, however, checked at regular intervals. They are given marks twice a year, on the report on their field work in farm management, economics and sociology and on their verbal presentation of a field report (a collective mark for a group of three trainees).

Trainee participation in running the Institute

Trainees are urged outside training hours to take an active part in the Institute's communal life. A memorandum issued by the 'Communal life' office defines the main objective of organized cultural, social and sports activities as being to encourage each trainee's individual potential so as to ensure sound psychological, physical and intellectual development, and also to foster trainees' sense of political and civic responsibility (i.e. an awareness of the importance of their professional future to the development of Algeria).

In the ITA training system, technical training and character development are inseparable. Organized activity in general is regarded as a pre-requisite to successful engineer training. To undertake the supervisory tasks expected of them, engineers should be not only competent in their own specialization and anxious to

serve the nation, but also capable of training others and modifying traditional institutions.

Organized cultural and social activities are, therefore, considered to be part and parcel of vocational training and an aid to developing a sense of responsibility.

A driving force in this connexion is the Trainees' Association, known as the Mostaganem ITA *Centre Culturel des Elèves-Ingénieurs* (CCEI) (trainee engineers' cultural centre) founded in 1971. Its aims, according to its statutes, are:

- to encourage recreational, intellectual and educational pursuits, physical training, arts and crafts, sports, economic and civic activity;
- to set up and promote cultural, arts and sports clubs;
- to promote friendly relations between ITA trainees and facilitate the exchange of ideas with trainee clubs in other institutions;
- to manage and develop the club's finances and other assets, whether inherited or acquired.

The Association undertakes not to pursue other objectives than those laid down in its statutes. All trainees are *de facto* members and no subscription is required. It is responsible to three bodies: (a) the Annual General Meeting, consisting of trainees in the first three years (those in their fourth year having moved on to pre-vocational training); (b) the Association's executive board, consisting of 15 members - 5 for each year - elected by the Annual General Meeting for a period of four years; (c) the officers, elected by the Annual General Meeting and consisting of a chairman, three vice-chairmen and a treasurer.

The ITA administration is entitled to take part in Association affairs and its Honorary President is the Director-General of the Institute. He is present when the outgoing officers submit their report on finances and activities to the Annual General Meeting and new officers are elected. In addition, the administration helps the CCEI by allowing it the use of lecture rooms and studios, and releasing trainees for CCEI work from time to time. The CCEI chairman is asked to attend the more important meetings of the administrative board, including those dealing with teaching methods and disciplinary matters.

The CCEI receives an annual State grant of 10,000 Algerian dinars. The ITA also contributes towards running costs, and did so in the amount of 15,000 dinars in 1974. The CCEI runs three

trainees' hostels, the income from which is used to pay hostel staff wages and to finance other activities.

Three CCEI departments co-ordinate activities. The 'Culture' department organizes drama (two repertory companies, total membership 100), music (four orchestras), a film club and a photography club. The repertory companies write and produce their own plays, which are usually on some political or social theme. Ten seminars or so are organized each year on a variety of subjects, for example, the agrarian reform and the administration of justice in Algeria. Every other month the CCEI publishes a newsletter, the *Revue ITA* which reports on daily events at the Institute. The 'Sports' department organizes some ten different kinds of games in which over 500 trainees take part. The 'Leisure' department is responsible for the three hostels each consisting of a bar, a lounge, a television room and a games room.

Trainees' living conditions play a key role in their communal life. Evaluating this role in terms of quantity and quality is, however, a difficult task. Trainees are housed in three apartment blocks in different parts of the town of Mostaganem. One apartment is shared by four to eight trainees. This semi-boarding arrangement does not help to develop contacts with the city's inhabitants. Trainees do, however, take part in local socio-political activities and collaborate with the youth movement of the *Front de Libération nationale* (FLN) and with the Committee set up to promote land reform. This committee has five representatives on the University voluntary services committee, which co-ordinates such services on a nation-wide basis. The ITA Committee, with the help of committees set up in lycees and other local or regional bodies frequently works on *Willaya* (county) public works projects. Trainees who volunteer for such work know that they are performing a service to the nation. They regard voluntary service as a privilege, a means of integrating with the rural population and developing friendships with Mostaganem's young people.

2. BASIC TRAINING

This consists of a common core of five main subjects: biology, chemistry, mathematics, physics and statistics. It takes up approximately 300 hours (in lecture rooms, laboratories and workshops) in the first year and 400 hours in the second year.

The training objective in mathematics is defined as follows: 'the engineer should be able to use mathematics as a tool in the

solution of agricultural problems'.

Lectures, which last an hour and a half, are broadcast over closed-circuit television. Trainees are provided with explanatory notes and exercise schedules. An instructor is available in the central studio to answer students' questions put to him over the internal broadcasting system. Other instructors move around the lecture rooms (one instructor being assigned to 13 rooms) each of which accommodates 20 trainees. Exercises are carried out individually, and lectures are followed by a discussion in which trainees compare their results.

A written mathematics course is handed out to every first-year trainee. It goes over various points which the trainee is assumed to have learned before entry at the ITA. It is not, strictly speaking, part of the curriculum but enables each trainee to bring his knowledge of the subject up to the entrance requirement of the ITA. The course consists of three booklets of 100 pages each, for the trainee's individual use. Each trainee is invited to check his own level before using these booklets. If aware of some weak points, he can make up for them by referring to the relevant section of the course, designed as it is as a refresher course. He can check his progress through a variety of programmed exercises of the linear type, each of which is followed by a test.

Training in chemistry, biology and physics is handled by the animal husbandry and farming sections of the Institute, and is confined to those aspects of the subjects which trainees need to know in order to meet the development targets set for those sectors. Laboratory work is supervised by teams of instructors specially trained for this purpose.

3. SPECIALIZED TRAINING

At the ITA, this is given in the third and fourth years. It has not been altogether satisfactory in relation to the development objectives outlined above, and an investigation is currently being conducted to find ways of improving it.

Specialized training

In the third year, this is based on job profiles and involves two types of activity.

- *Indoor work*, through which trainees learn about methods and how to apply them to the solution of given problems. The

mental approach they should adopt is described by the instructors, who discuss it with the trainees.

- *field work*, covering three phases: (a) briefing, in which objectives are defined and discussions are held on how they should be met; (b) actual field work, in which trainees are supervised by instructors (one to 12 or 15 trainees), concentrate on the objective selected, check for possible errors and seek ways of remedying them; (c) drawing conclusions, groups of four or five trainees process the data gathered and make suggestions on how the running of the farm visited or the development of a region might be improved.

It should be pointed out that such field training does not in fact bring trainees into close touch with development problems, the objectives of some sections differing from those of others, and sections being isolated from one another. Multi-disciplinary work is impossible to achieve in such circumstances. The studies conducted frequently have no impact on farm output since they cannot be implemented by the farmers. Third-year trainees therefore continue to be motivated in a scholastic way and truly professional motivation is difficult to reach. In addition, instructors are unable to take an active part in the field work. In view of this, steps should be taken by the planning authorities to involve the ITA far more closely in the solution of development problems and to allow ITA instructors to take part in the work of these authorities. Moreover, it is considered that trainee engineers should be given a kind of field training that is more consistent with the jobs to which they are to be assigned.

The changes proposed in this connexion and their possible advantages and disadvantages are examined in greater detail in the conclusions of this paper.

In the fourth year, trainees are expected to identify the objective of their field work in the light of their future employers' requirements and their own training level, which has been duly evaluated. They are expected to strike a balance between the two, with the help of instructors. Here it should be pointed out once again that the number of instructors - eight for 400 trainees - is inadequate. Since field work is organized in a variety of ways, the initiative shown by trainees and the amount of help they are given on the spot may vary considerably.

Instructor-training

Various other institutions which train high-level agricultural workers urgently need more instructors. Some of ITA's graduates are therefore to be assigned to them as such. These men will have been trained as both agricultural engineers and instructors. Out of the 1,600 engineers the ITA is expected to train by 1977, 900 are to be assigned to field posts and 700 as instructors. The demand for instructors thus offers considerable scope for present trainees.

Approximately 15 instructors are to be assigned to the Centre national de pédagogie agricole, an agricultural training policy-making institution. Fifteen intermediate-level institutes of agricultural technology are to be opened in 1977 to train workers at Class 4 level. Some of the instructors will be ITA-trained. Furthermore, 25 ITA-trained instructors will fulfil the function of director of training in agricultural training centres for Class 3 personnel. Since training at such centres is based on a specific type of farming (e.g. fruit tree, rotating crops) instructors appointed to them must be experts on one type or another. Finally, it is expected that by 1977, 160 of the ITA's own instructors will be former trainees. They will teach either common core or specialized subjects, or supervise work in laboratories and workshops.

These instructors perform a dual task since they are involved simultaneously with training and with production. There ITA training will have given them first-hand experience of practical problems which they have been taught to analyse. Instructor-training is geared to five main objectives:

1. Appraisal of problems faced by ITA instructors at various stages, such as definition of training objectives, curriculum development, organizing work in an actual farm situation, creating and developing learning situations.
2. Appraisal of measures taken by ITA instructors and the extent to which these measures meet trainees' requirements.
3. A general understanding of ITA teaching methods and their effectiveness in particular situations.
4. An understanding of the ITA training system and its emphasis on field work. This calls for discussions with instructors on over-all and sequential teaching approaches.
5. An understanding of teaching aids used at the ITA, whether for the purpose of imparting knowledge or to induce trainees to

express themselves, communicate and show initiative.

To meet these objectives, the level of training to be achieved at the end of each of the four years' training at the ITA has been defined. Thus, at the end of the first year of the common core, a trainee should be able: to work as one of a basic unit of three to five trainees and to integrate with study groups in the lecture room, and in practical training in the workshop; to communicate with other groups and with instructors; to use the ITA teaching system as a means of self-teaching, and also to use reference material in general and documents handed out before each lecture; to analyse a training objective and work out an operational strategy; to describe a training problem outlined by an instructor; to explain evaluation methods; to evaluate his own work.

By the end of the second year, the trainee should have developed an ability to analyse and summarize what he has learned. In particular, he is expected: to define, classify and analyse the work he has accomplished during the first two years of training; to establish a relationship between training objectives and trainees' behaviour patterns; to identify evaluation methods and establish their relationship to the end result as analysed; to select and check data on development problems, career opportunities (agricultural engineer or farming instructor-engineer) or on the specialization he will choose for his third year; to describe the ultimate objective of his future job.

By the end of the third year, a trainee should be able to work in a pre-vocational training capacity.

In the fourth year, trainee engineers begin in-service training as instructors in the institutions where they will be assigned on graduation. They do so in multi-disciplinary teams with a fixed objective based on job profiles and field requirements. For example, a team may be required to observe, diagnose and analyse a certain situation and make suggestions on, say, cereal crop cultivation on a certain plot of land. Before they do this they will have worked out a strategy by programming the various hypothetical situations and their inter-relationship.

On the basis of this programme a trainee instructor supervises a group of trainees assigned to him, with the help of the institution's trained instructors. He conducts briefing sessions on future field operations, supervises the field work and the post-field evaluation. At the end of his stay, the trainee makes an estimate of the training objective.

In-service training takes up half of the fourth year of training, but there is no fixed period for this. It is spread out over the year, and thus enables the trainee to become acquainted with the teaching staff of several other training institutions and with agricultural development planners.

Trainees are directly involved in farming operations in the second part of their pre-vocational training. Here again, they are grouped into multi-disciplinary teams called upon to solve a specific farming problem within a limited number of production units (not more than three or four).

At the end of in-service training, trainees write a paper which is an in-depth study of a production problem encountered in the field. It must be based on first-hand observation and should present the problem from the development official's point of view, i.e. it should propose practical solutions, involving changes in the self-management structures within the context of the agrarian reform. Trainees are also required to write another report on their in-service training, summarizing their experiences and stressing the analysis of training objectives. The report describes the role of an instructor in certain situations in the light of its impact on development in general and on the development of instructor-training.

The two paper complement one another. Work done during training and its relationship to the environment are dealt with in the report on in-service training. Farming problems are dealt with in the in-depth study. Together, the papers reflect the ITA's dual objective: to train both instructors and production engineers.

4. TRAINING IN ECONOMICS

As in other subjects, this training is both theoretical and practical, beginning in the common core. More time is devoted to it in the third year, with a specialized course on economics. At the common core level training takes up approximately 140 hours a year. In the third year this figure is eight times higher (over 1,100 hours), and training is divided almost equally between theoretical and practical work.

Theoretical training

This is in two stages in the first year.

- *Stage 1:* (a) studying the production, financing, supply and yield schedules of a self-managed farm; (b) establishing a

general operating budget for this farm.

- *Stage 2:* (a) budget analysis by ratios; (b) budget analysis according to gross profit margins.

In the second year, economics training is divided into five periods, each one of which includes three field courses.

The first period and the first field course are devoted to studying the farm.

In the second period and second field course, this study is continued, with the addition of comparative studies of farms of the same type. In such studies, a hypothetical farm, imagined by the trainees themselves, is used as reference point.

The third and fourth periods are devoted to organization of the work, more comparative studies, the theory of values, development strategy, and agriculture as a branch of the economy.

The last period is devoted to writing the final report. Trainees take part in a seminar on the agrarian reform during this period.

In the third year, some 50 trainees take the specialized course on economics. It is divided into four stages: general economics; the non-self-managed sector; the self-managed sector; plans to promote the self-management system and the agrarian reform. At the end of this course, trainees should be: able to understand and analyse the over-all economic context of their future field work; familiar with the recording, analysing and forecasting techniques of development planners; able to apply these techniques - and implementation techniques - at the production unit level; familiar with the work of government agencies which promote the system of self-management and the agrarian reform.

In terms of training objectives, trainees should be equipped to analyse and diagnose a situation, and suggest improvements at departmental, territorial (commune, district, region) or production unit level. They should also be equipped to work as managers of an office or co-operative store. Alternatively, they may work as development agents and as such, act as links with planning departments.

Practical training

This is acquired in the process of achieving ITA's policy of training by objectives and by attending the joint meetings organized as part of the communal life at the Institute.

By and large, practical training is geared to the ITA's training objectives. The description of field work and practical ex-

ercises given earlier has shown how alternating theoretical training with field work - both being checked at regular intervals - ensures sustained progress. As this method is used in the economics course described earlier, it is not necessary to go into any great detail, but it will be seen that practical training is effectively helped by trainee participation in the running of the Institute.

Eight trainees (two for each year) are invited to attend and to express their views at the meetings on teaching policy organized by the directorate of studies. Trainees may also attend and submit proposals at all meetings at the common core level. Two trainee representatives attend those meetings at which each completed stage of training is reviewed and future plans are formulated. Whole groups of trainees are sometimes present at such meetings. Half of the student body attend seminars on the agrarian reform. In principle, representatives of third-year trainees may attend other meetings of the directorate of studies but in practice they do so only if they feel that they are closely involved. Trainees may also attend the meetings of various sections (e.g. the rotating crops and agricultural machinery sections), to which they are regularly invited. The animal husbandry section holds seven or eight meetings a year, attended by 20-60 trainees.

Joint meetings are held on questions of discipline. The eight members of the management and co-ordination committee elected by the trainees are invited to attend. At least six must do so in fact. These members make suggestions and express opinions, and see the case files of both plaintiff and defendant. In the final vote, trainee representatives have the same voting rights as the Chairman and the five representatives of the administration.

The financing of the Institute's social and cultural activities is the responsibility of the CCEI referred to earlier. Fifteen trainees for each year devote a considerable amount of time to this, depending on the timing of the various events, which in turn depend on the trainees' field work commitments. Most activities are available from three to five days a week. On average, trainees spend an hour or two each day at a club or hostel. Part of the duties of the CCEI treasurer is to spend two hours a day at the club. Trainees are also represented at the household management level. There are two representatives for each year in the sections responsible for running the apartment blocks, catering (kitchens, cafeteria, supplies). These trainees spend one or two hours a day keeping an eye on the cafeteria (which can accommodate 320 and feeds an average of 1,500 at each meal). Permanent and informal

links are thus established between trainees and the various sections of the administration. In addition, five to ten organized meetings are held each year to discuss household management problems.

It is thus clear that at the ITA, every effort is made to provide trainees with thorough training in economics, during which they become familiar with the management problems of an institution of any size. It also gives them some idea of the wide variety of questions they will be called upon to deal with in their future careers.

III. Training organization and teaching equipment

The analysis of the main lines of the curriculum included references to some aspects of training organization. It will now be useful to describe its salient features and also the teaching equipment which the ITA uses to fulfil training objectives.

1. TRAINING ORGANIZATION

The theoretical and practical training provided at the ITA over a four-year period is organized on a well defined and progressive scale. In the first two years which make up the common core, trainees acquire a basic knowledge of agriculture and working methods. In the third year, they become acquainted with agricultural machinery and begin specialized training. In the fourth year, students are trained to take action, accept responsibility, work as a member of a multi-disciplinary team, in readiness for the job awaiting them. Moreover, the 25 most successful graduates are given opportunities to go to further training.

Training stages

The training as a whole is three-dimensional: in the lecture and documentation centres, where students are given theoretical training, appraise what they have learned in the field and prepare for the next field trip; in the laboratory they apply their theoretical knowledge and also acquire certain practical skills; in the field they become familiar with the rural scene, collect data and study actual problems.

To ensure that all these training phases should complement one another, the training programmes have been designed to integrate them at every stage. In principle, each stage is subdivided into four parts:

- instruction in lecture room, laboratory or workshop;
- field work planning;
- field work;
- application of field work findings.

In the first year, a training stage lasts from one to three months. Objectives are defined by a group consisting of a specialist in programmed instruction, and all instructors in practical training. Later, and on the basis of results achieved in the previous year, a 'producer-instructor' decides on strategies, content and the teaching aids to be used. The innovative nature of this approach should be stressed here. It involves objectives and teaching methods being systematically reviewed each year in the light of an objective analysis of results achieved by the end of each stage, and teaching methods being improved on this basis. The preparation of documents for any particular stage does not begin until this 'soul searching' and 'range-correction' exercise has taken place.

In view of the large number of trainees, systematic use is made of teaching by television. A team of five to eight instructors ensures that full use is made of the audio-visual documents prepared. At the start of the lecture two of these instructors are stationed in the control room to operate the closed circuit television system, which reaches all of ITA's 20 lecture rooms. Other instructors are assigned to 'relay stations', linked by telephone to the various rooms on the same floor of the teaching block, which together accommodate some 150 trainees. Communication between control room, relay stations and lecture rooms is a two-way circuit. There are two television screens in each lecture room, and a microphone through which trainees may ask for help from an instructor at one of the relay stations. The system does, however, have one disadvantage: instructors are unable to observe trainees' reactions in the lecture rooms.

The lecture is followed by evaluation sessions where trainees confer with the instructors and discuss what needs to be revised.

2. ASSESSMENT OF KNOWLEDGE

Trainees' knowledge is assessed in two ways. Firstly, during each stage trainees are invited to evaluate their own progress and the knowledge they have acquired during previous sessions. This method has not, however, proved very successful so far. Few trainees care to attend the sessions and those who do are inclined to over-rate their own performance, which was largely anonymous since trainees correct their own exercises and only the end result becomes known to the group.

Secondly, a great many examinations are held each year in each section: 21 in the first year in addition to the 20 self-evaluating sessions. The number of examinations goes down as training progresses: 15 in the second year, about 10 in the third (these figures varying according to section) and a final examination in the fourth year. Trainees are well aware of the importance of these examinations, which are in fact held by agreement between trainees to feel motivated, and it has been observed that they work particularly hard in the few weeks preceding an examination.

There are five grades of marks according to the extent to which trainees have achieved the objectives of one stage or another.

Grade 5 is given to trainees who have completely mastered everything they have been taught. Some of these trainees may be selected for more specialized training leading to higher-level posts. About seven per cent of the first batch of graduates obtained this grade. Grade 4 is given to those who achieve both objectives and sub-objectives. Grade 3 is given to those trainees who achieve the main objectives only. The large majority of them obtain this grade. Grade 2 reflects mediocre work, and Grade 1 unsatisfactory performance.

This grading system plays a key role in the training. Unsatisfactory work may lead to disciplinary measures, and to expulsion in extreme cases. Usually, however, it removes *ipso facto* the right to choose a field location or future job. Conversely, there is a reward system: a chance to study for another year, priority in the choice of a field location and future job, a chance of further training after graduation. Moreover, the grading system allows a wrong career selection to be put right. Seven per cent of the trainees in the first batch of graduates were in fact steered towards other jobs as a result of their grades. Trainees are kept regularly informed of their grades, which they may challenge in discussions with their instructors. The complete set of grades for one class also constitutes a basis for assessing the teaching. Instructors' reports take account of these grades.

3. TEACHING AIDS

Under this heading we will deal with the various types of teaching aids and equipment used at the ITA, which have been developed on the basis of trainees' aptitudes, and characteristics as observed at the entrance examination or during training and ITA's own ob-

jectives. The Institute's isolated location has also been taken into account. Teaching aids (print and non-print materials) and teaching equipment will be dealt with separately.

Documentation

This may be divided into outside acquisitions and in-house productions, the latter playing a key role in training because their educational approach is closely linked to ITA's objectives. Both print and non-print materials fall into these two categories.

Printed materials

ITA's approach here is distinctly innovative and has produced a full-scale 'data bank' for the Institute's own use. Facts on the Institute and its environment are systematically gathered, analysed, stored and disseminated. This system helps to revamp training in the light of experience gained in previous years. It is known as ITA's 'institutional memory', a term which reflects its useful role. It ensures a constant flow of data useful for analysing practical problems, learning processes and training methods.

The 'institutional memory'

A documentation department is responsible for collecting, classifying and circulating a wide variety of documents, which includes studies written by instructors, reports and papers written by trainees as part of their training. An analysis and processing department concentrates on the collection and analysis of information on jobs and pre-vocational jobs (filled or vacant) and other jobs in education and research proposed to trainees. In a large institution like the ITA, data obtained on teaching methods can be pooled, processed and disseminated, as is the case with evaluation reports on each stage of the training. Since any large institution is bound to have relatively autonomous structures such as 'cells', 'sections' or 'departments', their co-ordination is helped by this constant exchange of information. All kinds of information - even when conflicting with one another - are fed into the system and then stored, storage being essential for a cumulative effect.

Access to documents is facilitated by a key-worded card index, based on a thesaurus drawn up jointly with the National Agricultural Training Centre in Algiers. The thesaurus contains 1,200 key-words used for literature searches in a dozen fields (e.g. the exact sciences, agricultural machinery). Each card lists the reference numbers given to the various information items under one

keyword (books, journals, studies, reports, term papers, photographs, slides, films, tape recordings and video tapes).

On the basis of evaluation reports, which are the backbone of the 'institutional memory', 'fact sheets' containing significant facts and figures are drawn up. The original documents consist of studies and surveys such as the following: studies on the trainee population (a sociological study carried out at the time of the entrance examination, a survey of selected fourth-year trainees, records of interviews from which to analyse trainees' reactions, evaluation studies of the 'range of activities' proposed to trainees, and trainees' working methods. There are also annotated lists of documents available for each subject at the common core leve, to help instructors make up sets. Surveys of fourth-year trainees working on self-managing or privately run farms are used in job analyses. 'Session files' have been compiled on the basis of surveys of teaching methods used at some stage in the common core. Every year, 17 end-of-stage reports on the first year of training are produced, in addition to formal and informal appraisals written by instructors of the various sections in the third year. Many more examples could be given of the wide variety of documents available to instructors and trainees. Between 100 and 200 new documents are produced each year. Their usefulness as a reference source is borne out by the fact that, out of 1,500 documents available on loan, some 900 have been borrowed by individuals or institutions outside the ITA, for example, instructors at other institutes of technology, 'Willaya' agricultural departments and fourth-year trainees in pre-vocational jobs. The large number of such outside loans only serves to confirm the educational value of these documents.

Documents for teaching purposes only (lecture documents) are written by specialist instructors with reference to the training objectives for the corresponding period. Such documents are much like a chapter of a textbook, with the difference that the chapter is self-sufficient and requires no further elaboration during the lecture, thus completely eliminating the use of reference material at lectures. In time, the documents make up a collection of reference material which trainees may keep for use in their future jobs.

The production of lecture documents places a heavy burden on the instructors. It usually takes four days' work to produce a set for just one lecture. Instructors use their own reference material or that obtainable from the library. They may also seek

help from government agencies where more specialized documents are available for consultation on the spot, loan or free distribution. Teaching documents are reviewed and up-dated every year as part of ITA's policy constantly to adapt teaching to circumstances.

The documentation system frequently gets bogged down, however, owing to the vast amount of documents to be processed, which exceed the capacity of the documentation department. Problems to be analysed are occasionally very complex ones and on the whole, selection of useful material calls for the establishment of far too many correlations. An information processing system would of course solve this problem, and the ITA plans to install a computer for this purpose.

'Conventional' printed documents

The main library has holdings of over 9,000 books representing 3,700 different titles. A large number of books are out on permanent loan to the various sections which make constant use of them. Over 50 per cent of the holdings cover three main subjects: exact sciences, economics and the humanities. An average 3,000 books are borrowed by 1,600 trainees each year, and 700 by instructors and the Institute's staff. The library also subscribes to various magazines which are consulted on the spot. Delivery on an order for books may take six months to a year. Any instructor may order through the ITA documentation centre. The books are purchased by the Société nationale d'édition et de diffusion, which processes the orders of various agencies. Regrettably, this institution does not deal with those institutes of technology which publish numerous important documents. Only very few such documents therefore reach the ITA, and only through unofficial channels. Undoubtedly, the present organization is inadequate.

Audio-visual documents

Audio-visual holdings include some 24,000 slides, 40,000 photographs, 200 16mm films and 1,400 ITA-produced television programmes. Most of the latter are on the exact sciences, economics, agriculture, farming, animal husbandry and Arabic language instruction. This wealth of highly diversified material is accessible to trainees through their representatives on the CCES and the CSRA (Committee for the promotion of the agrarian reform).

The aim of teaching by television is twofold. Firstly, it enables one instructor to deal with 1,000 trainees at the same

time, thus cutting down teaching staff requirements considerably. Secondly, television helps trainees to acquire a more thorough understanding of what they have learned in the field and of the jobs to which they will eventually be assigned.

Besides purely instructional television programmes, there is a collection of videotapes on development problems in general aimed at developing a positive attitude in trainees towards such problems. Under the sponsorship of the CSRA, trainees have themselves produced several television programmes on, among other things, youth, woman's role and war. Such programmes are scripted, produced and shown by small groups who thus learn how to organize a documentary programme and a subsequent discussion.

Some instructional television programme illustrate the jobs to which trainees will be assigned, so that trainees become familiar with their future role. An example are those programmes depicting the role of engineering instructor at the intermediate agricultural technology institutes at Tlemcen. They were produced for instructor-trainees in the first ITA batch and deal with specific questions such as curriculum-programming and distribution, thus familiarizing instructor-trainees with the methods used by those instructors whom they will eventually be called upon to replace.

Two twenty-minute programmes show the role of the engineer as a development agent. One is about a voluntary service project at Mesra and the other on socialism in general. They have been viewed by 1,500 trainees who were thus made aware of their role on a voluntary service project.

How the documentation is used

As a concrete example of how the documentary holdings are used mention may be made of a lecture produced and given by a group of third-year trainees. At the start of the academic year, instructors of their section gave them a list of possible subjects. The trainees then split up into basic units of four, each of which selected the subject on which they would lecture to a score of trainees later in the year.

In addition to the print and non-print materials given them by the section instructors, the trainees were provided with documents originating from, for example, institutes of technology abroad and various Algerian agencies (mostly the results of some experimental project). To all this the trainees added their own comments on their work in the field.

The lecture developed in the following way: the basic unit defined the subject, main objectives and sub-objectives, decided what paper and audio-visual documents they would need and discussed these points with the instructor, at which stage they may have been asked to revise certain plans. Once the framework was established and the audio-visual documents requested had been viewed, the final selection was made by consensus. The actual work was then divided equally among members of the group to ensure thorough preparation, and full details of their plans were given to the instructors, who were thus informed of the trainees' work schedules and timetable. Final plans were then jointly discussed and laid down.

How the documents are produced

Between 1,200 and 1,700 pages of documents are produced each year for theoretical training lectures. The documents are prepared by instructors, who have access to the library at all times and can take out books they will need constantly on permanent loan. Their handwritten drafts are given to the reproduction department, which has a typing pool, an illustration section and a printing shop equipped with stencil and offset machines. The department employs 40 workers and consumes an average 1,500,000 sheets of paper a month. Drafts must be handed in at least one month before the deadline. This can prove difficult when, for example, documents are needed quickly to cover points which call for revision if they have not been properly grasped.

For the production of television programmes there is a recording studio and several mobile film units. An instructor who cannot find a programme suitable for his particular purpose may produce one on his own initiative. This usually takes seven weeks and involves writing the script, filming, photographing, producing drawings, recording and editing. The ITA has several studios from which instructors deliver the televised lectures. Preparing one such lecture is usually half a day's work, involving selection of audio-visual documents with the help of an optical scanner. Instructors may of course introduce additional sequences in an existing recorded programme. They have access to the holdings of films, slides and photographs, for which duplication facilities are available. Here again, however, reproduction takes rather a long time: about 48 hours for some 10 photographic plates. A televised lecture must in all cases be planned well in advance, and the department dealing with the allocation of lecture rooms duly advised.

The laboratories

The ITA has 15 laboratories for practical work in chemistry, biology, soil science and plant protection. There is also a preparation room, a livestock testing room and a storeroom. Twelve instructors are responsible for running the laboratories. Owing to the large number of trainees assigned to practical work at the common core level, each instructor has to repeat each laboratory class twelve times.

Relevant documents are circulated at the start of each laboratory class. The instructor then explains and gives practical demonstrations of the work trainees are required to do. Trainees work in groups of two and are constantly helped by a laboratory assistant. They note their findings on cards which are then corrected, marked and forwarded to the common core teaching department.

By way of an example of practical work in chemistry, first-year trainees begin by learning how to handle laboratory equipment, then carry out analyses of foodstuff contents. They also study soil characteristics and volumetric assays. In the second year they analyse the calcium content of soil samples, test milk for quality control and identify rocks. In plant biology, first-year trainees observe and describe component parts, and learn identification criteria for plant species. In animal biology, they dissect carcases and study the various stages of reproduction (egg fertilization and early segmentation). Practical work in the second year includes the study of perennial crops.

Laboratory work in the third year is considerably more sophisticated and is organized according to the specializations of each section. Fourth-year trainees have access to the laboratories at all times, field work schedules permitting, so are able to correlate their theoretical training with their field and laboratory work. Such was the case in a study of nematodes, a type of vine parasite. Trainees were briefed in the lecture room and in the field, they tracked down breeding areas and took soil and root samples. In the laboratory, the parasites were analysed according to different methods of preparation, colouration and extraction. The many approaches adopted in this experiment gave it a high educational value.

The workshops

The ITA has four workshops: agriculture, animal husbandry, agricultural machinery and surveying. A supervisor is responsible for co-ordinating teaching, administration and operation. As will be

seen from the following description, the concept of a 'workshop' is very broad at the ITA. A workshop might be a vast tract of land on which trainees carry out 'life-size' farming operations; or it might be a small classroom where trainees are briefed before they begin such operations.

Workshop training comes under five main categories, for which objectives and examples are given in each case. The categories are:

(a) methodology, in which trainees learn to apply observation methods to a plot of land by observing its soil and plants;
(b) techniques: in surveying, trainees learn to use maps to spot the location of a particular plot of land to be surveyed, to calculate its area and to work out the direction of the steepest gradient;
(c) manual work: digging a soil profile under crops;
(d) reflex training: how to approach and immobilize an animal according to the safety rules applicable in the case of each species;
(e) observation powers: how to identify cereal crops before the ears are formed.

Workshop structure, equipment and organization vary according to training objective. The *agricultural workshop*, six kilometres away from the ITA, is a 20-hectare plantation, growing vines, fruit trees, seasonal crops such as cereals and greens, animal feed and market gardening crops. The machinery needed for the work to be carried out is obtained from the machine shop five kilometres away, where four instructors and four mechanics are assigned on a full-time basis. The workshop also has four classrooms accommodating 20 trainees each, a farmhouse, a storeroom and an office.

The *animal husbandry workshop*, is two kilometres away from the farm workshop, and eight from the ITA. Livestock consists of 21 horses (available to members of the riding club), some 30 head of cattle and 80 sheep. A beehive is being set up. The workshop has a great many facilities: classrooms, a laboratory, a veterinary infirmary and operating theatre, a delousing station, a clamping yard for ten head of cattle, free stalling for ten milking cows, a traditional cow stall and two hectares of grazing land. The personnel consists of one instructor, a stable lad and three workers. Two verterinary surgeons make regular calls.

The *agricultural machinery workshop*, four kilometres away from the ITA, consists of: two classrooms with accommodation for 20 trainees; a workshop shed; six work benches with five or

six working places at each; storage sheds; a two-hectare test and demonstration track. There is a complete range of agricultural machinery: tractors, machinery for ploughing, earth-moving, harvesting, haystacking and processing. Machine tools and soldering irons are available for urgent repair work. Model and bench engines are used for teaching elementary mechanics. One supervisor is in charge of all machinery and its allocation, and another is in charge of specialized training (third-year trainees).

The *surveying workshop* is on ITA premises. Theoretical work is done in classrooms and the practical work is carried out on land outside the Institute. The workshop has sets of surveying instruments and various types of levelling and measuring equipment. Documentary holdings include 9,000 aerial photographs, 200 ordnance maps, about 30 television programmes, and sets of slides. The workshop is run by six supervisors, and a female draughtsman who produces the documents.

A workshop class lasts two or three hours and is given to groups of 20 trainees. In the first two years of the common core, the number of classes per year varies from four to ten according to workshop and goes up considerably in the third year, when 13 classes are organized for the seasonal crops section, 20 for agricultural machinery, 25 for forestry, and 40 for country planning.

The work is extremely varied. It may consist of observations followed by data-processing, such observations leading to, for example, identification of a stage in cereal growth or estimation of crop density per hectare in order to draw up a planting schedule. Alternatively, it might be work of a more practical nature such as setting and defining the functions of a tool in a specific farming operation. Training in surveying has a special programme, each stage consisting of two classes including television programmes and map-reading, followed by actual surveying work out of doors. An increasing amount of time is being devoted to photograph interpretation (about two-thirds of the practical work timetable in the second year).

Thus, the range of teaching equipment used at the ITA is wholly comprehensive and combines teaching aids with equipment for practical work. This vast array of equipment enables trainees to apply theoretical knowledge to practical purposes under real farming conditions. The fact that the various workshops are some distance from the Institute is indicative of the real dimension of its campus.

IV. Field training and its role in the ITA training system

The importance attached to field work at the ITA has already been stressed. The novel approach to its planning and organization is its close integration with each stage of the training. Field courses fall into four main categories: the adaptation course, the common core field course, the specialization course and the pre-vocational field course in the fourth year.

1. THE ADAPTATION COURSE

On entry trainees spend only 24 hours at the ITA to go through certain formalities. On this first day they are divided into basic units of three. Seven such units make up a group. They are then briefed on the adaptation course, with particular attention to the objectives of the first phase, and are sent out into the field at the rate of one basic unit per self-managed farm. The 1,050 trainees in the first batch were spread out in this way over 350 farms, which were sub-divided into 47 'field areas' containing seven basic units each. The whole course was in the hands of 36 supervisors who between them looked after 16 'sectors', each consisting of three areas. The adaptation course lasts nine weeks and its objectives, as outlined in the 'Guide to the adaptation course', are twofold: an educational one and a methodological one.

The educational objectives

The over-all aim is to give the trainees an opportunity to gain first-hand experience of the farming world, to adapt to its community and to note everything they observe with a view to suggesting possible changes. In so doing, trainees are asked to show how far farm management is influenced by traditional structures, social and economic factors and the various technical, administrative and marketing organizations. They are then able to suggest the possible causes of this influence and the likely consequences. This part of the course is not, therefore, so much instructional as an introduction to the self-managing farming community.

The methodology objectives

The range of approaches used during the course are designed to serve trainees as an introduction to methodology. No attempt is made to check whether a trainee is capable of any particular mental process, even though the course is undoubtedly a period of learning in this respect. The aim is to lead trainees to the conclusion that if a specific objective is to be achieved, certain methods will have to be followed. The adaptation course therefore prepares trainees for the instructional training they will later receive. The ITA system of training by objectives inevitably involves methodology, and one of the objectives of this training is the principle that for every course of action there is a method to be followed.

Without listing all the thinking processes trainees are expected to undertake during the course, the following may be quoted: deciding what facts need to be known to study a certain subject; defining the area of the field of observation; selecting a sample and assessing its representativity; correlating various sources of information; detecting discrepancies and formulating hypotheses.

The adaptation course is also an introduction to group work. This is new to most trainees, who occasionally have trouble adjusting to it and it is at all times difficult to organize. Although the adaptation course is not specifically designed to teach group work, it is expected to reveal the difficulties and bottlenecks which may occur and so lead to an understanding of the way the groups and basic units work in the evaluation period which comes after the course. A self-evaluation card has been designed for this purpose, to be completed by the members of each basic unit after every period of training.

Organization of the course

Introduction to the farming world is organized in five stages based mainly on trainees physically participating in the work involved, observing and talking with the workers on a self-managed farm. A meeting of all basic units in the same area is organized at the end of each stage.

In the first stage, the trainee gets acquainted with the workers he has met in various parts of the farm. In the second, he assesses the extent to which these workers have an adequate knowledge of the farm's main crop and tries to find out whether there is any relation between this knowledge and the workers' attitude towards the job they are given to do. The third stage tackles

social problems, for example relations between workers of various categories and their share in decision-making on questions of production. The fourth stage is devoted mainly to observing the workers' living conditions and their integration in their respective communities. This should enable the trainee to assess the effect of the environment and the extent to which it affects behaviour and attitudes in the course of a day's work on a self-managed farm. The fifth stage culminates in an over-all appraisal of the farm from the point of view of self-management and of the significance, in this connexion, of the farm's own structures and the role played by outside agencies. These structures may prove to be entirely consistent with the laws governing self-managed farming or may, on the other hand, depart from them. In either case trainees are expected to produce ideas based on their observations.

The role of supervisors

The supervisors on the adaptation course are instructors from the various sections of the common core, the laboratories and some sections of the third year. They are briefed on how to conduct the course at two preliminary meetings, the main points of which are summarized in the 'Guide for supervisors'.

During the course supervisors intervene in many different ways. They have to solve all material problems, put the trainees to work and remind them when necessary, of the objectives of the course. Whenever they think it advisable they encourage trainees to express themselves or to think harder about what they observe and experience. They provide methodological support to the trainees' attempts to observe and correlate facts. Finally, they organize and supervise the meetings held at the end of each stage to review the work accomplished, discuss certain points and brief the trainees on the next stage.

Development of field work

On returning to the ITA each basic unit produces a final report, which is corrected by a supervisor but not graded. One class is devoted to discussing this report as corrected. Finally, the supervisors and trainees, a government agricultural official and a farm manager get together at a round table conference, at which trainees may ask questions on the course and on the self-management system. Trainees appear not to regard this procedure as altogether satisfactory, and the proposed improvements are outlined in the conclusions.

2. THE COMMON CORE FIELD COURSE

During their first two years of training, trainees attend four or five ten-day courses in Oran province. These are sandwich courses, closely linked to a particular stage in the training. In addition, four days are spent visiting various farms and institutions.

Trainees are split up into the same number of units and groups as on the adaptation course, an arrangement which helps to organize the courses according to subject matter. The four main subjects at the ITA are: animal husbandry, agriculture, economics and sociology. There are usually two or three field courses for each subject, so that each trainee is involved in only a portion of the field training as a whole. At each stage of the course trainees are assigned to a specific task, directed towards the objective defined at the start of the year. In economics, for example, a trainee is required to obtain what documents he needs to establish a farm's operating account, and to note the final balance sheet of the farm on which he is working. In animal husbandry, a trainee observes and studies the various species on the farm and must process his observations into utilizable data on the characteristics of these animals and their productivity. In sociology, a trainee must be able to explain the choice of self-management, the constraints of cattle-breeding, how the workers are reacting to them and the possible human and technical consequences. The objectives of the common core courses are therefore very different from those of the adaptation course. The aim here is to conduct an actual field survey and to make good use of the knowledge acquired in the instructional training at the ITA. What the trainees learn on the field courses will be useful in the theoretical and practical exercises they will carry out at a later stage.

The importance attached to interaction between instructional and field training stands out clearly in the following description of one stage in a field course, taking the agriculture course for first-year trainees as an example. The clearly defined objective is to collect data on the soil and plants of a specified plot of land. The course begins with ten classes at which instructors describe the stage as a whole and the methods to be adopted in the field. These classes are designed to give trainees a general theoretical knowledge of the plants they will be studying in the field. In the laboratory, a trainee makes a detailed study of the morphology of one such plant and then goes on to the farm workshop where, in five training sessions, he practises the operations he will later be expected to carry out, on his own, in the field.

The first part of the stage ends with two briefing sessions, at which a trainee is taught, among other things, how to process observed facts and how to use the guide given to him, which describes the duties of his basic unit.

Trainees live on the farm during their field training. In this particular case they must select the plot to be surveyed, investigated its crop history, carry out a ground survey, make a provisonal location estimate, go over the plot and establish measuring stations. Every basic unit keeps a logbook in which each day's work is recorded, including details of methods and techniques used. The trainees must also draw a map of the plot selected and note their findings on record cards which will be used afterwards in the comparison with other units' findings.

In the instructional period, three classes are devoted to evaluation, at which time any discrepancies between the findings of two basic units working on the same plot of land will emerge and the more obvious ones will be identified and explained. A trainee's work is therefore evaluated by comparative methods, enabling him to review the methods used and to improve them if need be. As a result of this evaluation, both supervisors and trainees are in possession of all the facts they need to make an over-all appraisal of the results achieved during the stage in question, and these results are then considered in the light of the initial objective.

The foregoing is a very simple example of the interaction between field and instructional training. In actual fact the close integration of the two is somewhat more complex, as, for example, with the two field courses in the second year known as the 'outward trip' and the 'return trip'. The outward trip is a ten-day, fact-finding mission carried out under the supervision of an instructor responsible for 14 basic units. It is followed by 11 classes at the ITA, at which the fact are analysed and alterations to the plan may be proposed. In the return trip, which lasts six days, basic units submit proposals to the managers of the various farms. By this time they should be in a position to suggest how their proposals can be implemented, and to forecast the technical and social consequences. Emphasis in this course is laid on the social aspect to enable trainees better to identify the human problems involved in running a farm. Finally, at the ITA the basic units report verbally to a panel of judges on the return trip and its results, all of which helps the over-all evaluation of the various types of agricultural activity, whether it be animal hus-

bandry or some other activity.

3. THE THIRD-YEAR FIELD COURSE

In the third year, field courses are of longer duration, as much as 90 days for some specializations, and are supplemented by visits to various engineering projects. A total of 72 days is devoted to this kind of field study, and the visit organized by the agricultural machinery workshop alone lasts nine consecutive days.

The courses are designed to help trainees to look at agriculture from the point of view of production. On the farm where they work they must find actual situations to analyse and compare, in order to produce a diagnosis and taxonomy of production problems identified. The course objectives are designed with this approach in mind. For example, in the perennial crops section, a trainee may be expected to produce a diagnosis of the co-operative and self-managing sectors and to suggest possible improvements. This he must do at the land level (improving yields in terms of both quantity and quality), at production unit level (improved production by optimal use of available resources) or at the level of a subregion providing a sample of production units (agricultural development through publicizing results achieved). Similar tasks are given to trainees in other sections. The foregoing is but an example of the practical work involved to achieve a specific objective in a development framework.

In the third year, trainees are reshuffled into basic units of four. Each unit works independently and the section they belong to makes no attempt to co-ordinate results. The supervisors, who look after two or three basic units each, are thoroughly familiar with conditions prevailing in the field. The year's field training is divided up into separate periods, as is required for the division of labour according to the seasonal cycle. For example, the seasonal crops section's two-month field course is divided into five periods for winter crops. In between periods trainees return to the ITA where they use the data collected and receive further instructional and workshop training. This sandwich method does not, however, cause any break in continuity because each period is regarded as a separate entity on which trainees work part-time. Before the final diagnosis stage the trainee may also conduct individual surveys of various types of crops.

4. THE FOURTH-YEAR, PRE-VOCATIONAL FIELD COURSE

This last seven months and takes place entirely outside the ITA. The trainees' field assignments are worked out on the basis of the employment records of the previous batch, which are examined each year in the light of existing vacancies in various agricultural organizations. At the end of their third year trainees may choose their future job, and this choice determines the location and conditions of their field training.

During this course trainees are given assignments modelled closely on the structures of their future employers. They are expected to carry out a technical job, to work within a multi-disciplinary team and to refine their specialization, so as to be fully prepared for the position awaiting them. The course thus offers responsibility training and a transition between training and working life.

Trainees find employment in two kinds of agricultural structures: those based on the integrated development of several production factors (e.g. the Willaya and Daïra agricultural directorates, the rural development commissariats) and those sectoral development authorities responsible for the development of just one sector (e.g. market-gardening and cereal development projects, various research institutions). Although engaged in batches, trainees are usually assigned to the same division or project.

Supervision is left to the employers and varies considerably from one employer to another. In many cases the senior staff have little time to spare for this purpose and trainees do not get all the help they need. Some employers do, however, keep the trainees under constant supervision, as is the case with the integrated development authorities. In addition, the trainees are regularly visited by those ITA instructors assigned to fourth-year training full time. Such a visit usually lasts half a day. Finally, trainees are invited to seek help from the ITA itself, by asking for guidance and documents they might need. However, few trainees avail themselves of this opportunity.

As mentioned previously, trainees are required to submit a paper and a final report on their field training to a panel of judges. In the case of the paper the panel assesses the trainee's scientific and technical competence, his ability to use and to criticize information acquired, to research, choose methods and techniques, his consistency and technical expertise. In other words, a trainee is expected to apply observation, analysis and ideas to

practical purposes. The panel also considers the field of study, innovative aspects and the value of the results set out in the paper. In the case of the report, the panel considers the extent to which the set objectives have been achieved, bearing in mind organization of the work (work schedules, adaptability to farm conditions, whether the trainee worked as one of a team or mainly on his own) an understanding of techniques used (selection, utilization, criticism). The panel also notes discrepancies between results and objectives. It expresses opinions, criticizes the work performed and comments on the role of a development agent and on the training in general.

During their four-year training at the ITA trainees are in touch with the rural world for more than half the time (i.e. through both visits and field work). For both theoretical and practical training purposes the advantages of this kind of training are obvious, and their effects can be immediately assessed. The advantages are equally obvious with regard to character development, but in this case far more difficult to evaluate. In the long run, the quality of ITA training will be reflected in the successful adaptation of its agricultural engineers to the work they have to do. However, the ITA is of too recent inception for its effectiveness in this direction to be analysed objectively at the present time.

Conclusions

It seems appropriate to conclude this study with a summary of ITA's achievements and the difficulties it has encountered, and to consider how its present structure and staffing arrangements might be altered in order to improve the training provided there.

ITA's achievements are beyond doubt, and are best appreciated by being considered in date order. The first achievement was the recruitment of trainees. As a result of intensive publicity in secondary and technical training institutions, the ITA managed to recruit trainees who were a representative cross-section of young Algerians qualified to enter higher education. In spite of their very different backgrounds, ITA has managed to develop a team spirit among them. The organization of both theoretical and practical training has deliberately broken away from traditional methods, regarded as the root cause of a passive attitude. Instead, a strategy was developed to encourage initiative and a desire for self-teaching in each individual. To do this, theoretical training had to be of a kind that could be instantly assimilated by trainees and closely linked to set objectives. In this connexion, the constant review of curricula and teaching methods, described at some length in this study, is a decidedly innovative approach which has made heavy demands on those initiating it but which brought about considerable improvement in the quality of training. Once field training has been further developed, the real value of alternating and integrating practical with theoretical training will become apparent. Furthermore, the ITA provides training in a wide variety of specializations closely modelled on the job profiles of its trainees, and it has the necessary teaching equipment to provide such training under the best possible conditions. Field training in the fourth year is designed to meet the acute need for a gradual transition from a trainee's relatively dependent status to the relatively independent one of a young engineer faced with responsibilities he must shoulder on his own.

The problems encountered by the ITA appear to stem from the very large number of engineers it is expected to train. As pointed

out in the introduction, this is dictated by the needs of Algeria's agriculture for massive training of high-level personnel in the shortest possible time. But it poses problems of various kinds in running the ITA. In the first place, some groups of trainees are inclined to feel isolated from other groups. For all the undoubted advantages of self-teaching, trainees fresh out of secondary education do need constant supervision and guidance in order to keep up with the programme drawn up by ITA's directorate of studies. It is all too obvious that the instructors and supervisors at the ITA, dedicated and hard-working though they be, are far too few in number and cannot provide the help and guidance which trainees expect of them. Although mass education policies are of course consistent with the country's needs they cannot be made to work without the right number of teachers ready to help any trainee in difficulty. Considering the level of proficiency which ITA trainees have achieved on graduation, there can be no doubt whatsoever that more help in this direction would lead to an even higher level of achievement. Training such numbers calls for the large-scale use of teaching aids which have to be manufactured and distributed on the spot. Reference has already been made to the somewhat cumbersome document reproduction services and the problems arising when an initially unsatisfactory document has to be revised and reprocessed in a hurry. In field training, the large number of trainees has to be spread over a great many estates, which the ITA has no means of selecting on the basis of the quality of training there. Here again there are not enough supervisors. The present ones have to cover so many extensive areas that they are only sporadically in touch with trainees who frequently need their help. On the whole, it has proved difficult to run an institution which has to train some 1,600 engineers. If circumstances had so permitted, the setting up of several smaller instructional units would probably have produced still better results.

All these difficulties have not escaped the attention of those officials in charge of the ITA, who have now drawn up a plan to revamp structures and training objectives.

This plan provides for the ITA being more closely involved in the country's development problems by enabling its instructors to participate in solving them and its trainees to receive a training more in line with their future tasks by being faced with actual problems at an earlier stage. This would call for more instructors and, as pointed out previously, 160 engineers trained at the Institute are to return there in that capacity. In order to bring

the Institute closer to its field of operations the plan provides for certain sections of the third year being moved to locations outside Mostaganem and making this decentralized body responsible for some of the training. Later, fourth-year trainees might be spread over the various regional schools to maintain the multi-disciplinary nature of this stage of the training. Decentralization would no doubt strengthen relations between development authorities and ITA instructors, who would then have an opportunity actually to take part in development work.

Such a strategy would make for a specialized training that is truly consistent with reality. To achieve this the educational and methodological approaches would have to be revised. Trainees would no longer visit some institution or project as spectators, or attend courses in which they observe and appraise things that can have no visible impact on the running of the farms where they work. The training process should in fact be linked to a methodological study *in situ* of agricultural problems and genuine development problems. The objectives of the third-year training should be re-styled along the lines of a development operation. Moreover, ITA instructors should play a far more active role. If involved in the productive sector they would indeed acquire considerable practical experience which would benefit the trainees for whom they are responsible.

Practical measures have been worked out for the implementation of the proposed plan. Instructors are to spend at least two days a week in the field; a standing panel of agronomists will supervise the training; training contracts will be drawn up defining the roles of each party at the production, training and research levels; fourth-year trainees will act as instructors vis-à-vis third-year trainees; and an education specialist will be assigned to each specialized training section to supervise every stage of the field and other training in the third year, and to help organize refresher training for fourth-year trainees.

Any reform project is bound to have certain drawbacks and to cause a measure of inconvenience. In this particular case there is some danger of too many specializations making multi-disciplinary work more difficult to organize. Instead of thinking in terms of 'technical specialization' it might be more appropriate to consider 'specialization in certain jobs'. Such an approach would call for regular meetings and visits to the ITA by its graduates, as well as regular meetings between the various sections. The duties of specialized training instructors should be planned in such a way

as to ensure a sufficient level of multi-disciplinary work in each section. If the Institute's activities are to be spread over a wide area there is also a risk of weakening relations between the common core and the specialized training sections. Such relations are insufficiently developed as it is. This difficulty might, however, be overcome if each section were to redefine the profile of its trainees and if the common core curriculum were restructured so as to encourage a constant interaction between basic training and the curriculum of each decentralized section. Methods would have to be harmonized to provide for a transition between the common core and specialized training. It is essential that ITA should continue to be responsible for the training as a whole. This calls for the setting up of a communications system, improved supervision and guidance of trainees, and an organization which would objectively analyse the training in all sections scattered among the regional schools.

To achieve the foregoing objectives, field training would have to be used to better advantage. Actual experiences would have to be reconstructed and analysed according to conditions prevailing in the field. Field work should be recorded in greater detail. In the first year of the common core 'facts' should be studied more thoroughly, and training in sociology and economics should be further developed.

Other measures proposed would help improve the quality of supervisors' work. At present many supervisors receive the same adaptation training as do the trainees. On the whole, supervisors do not have all the information they need correctly to determine the purpose of their interventions in the field. Plans should therefore be made for briefing sessions at which, among other things, supervisors' administrative duties would be defined, as would their supervisory duties on field courses, details would be provided of the information required about self-managed farms, the adaptation and evaluation stages and the purpose of each intervention in relation to the ultimate objective, which should amount to a perfect integration of the field course in the training in general.

Finally, it would be desirable for ITA-trained engineers not to lose touch with their alma mater. Renewing contact would enable them in particular to keep themselves up to date through some form of continuous training. A plan along the lines was in fact drawn up in 1974. It stresses the need for continuous training and provides for a permanent organization which would:

- deal with working engineers' requests for documents;
- information, consultation, introductions and advice;
- disseminate up-to-date information on technological developments and on specific situations relating to development;
- arrange for a multidisciplinary team of fourth-year trainees to make a study of a field problem raised by the engineers;
- organize seminars for engineers in senior positions and multidisciplinary teams of ITA instructors.

The ITA would itself benefit from such a plan since it would then be better informed on the various problems faced by its graduates. It would also be able to analyse existing relations between former trainees and encourage future relations, distance factors permitting. It could better evaluate its training and consider possible changes in curricula and even in the running of the Institute as a result.

This outline of development prospects stresses the dynamic nature of the objectives the ITA has set for itself. The ITA is resolutely looking to the future. It is anxious to improve the quality of its training and if fully aware of its responsibilities in the development of Algeria's agriculture. It has already shown ample proof of its efficiency, and deserves that the hard work put in by all members of its staff should produce results that would justify the faith which its planners have always placed in it.

Questionnaire (19)

To develop the series further, it would be helpful if readers could record their impressions and inform the IBE. (Please write 'yes' or 'no' in the space following each question. Further comments may be written on the back of this sheet.)

1. Do you find the author's analysis useful for your own work? ☐ in particular, is it:
   - an adequate survey of the field? ☐
   - a basis for further discussion and study? ☐
   - too abstract to be useful? ☐

2. With regard to the sources cited, could you indicate any recent documents of a similar type which have been overlooked?

3. Can you indicate any cases of innovation in your own country (or field of specialization) which you feel might have interest for other countries if adequately written up? Please name the person or institution able to provide further information about the project.

Please indicate your name and address and return this questionnaire to: the International Bureau of Education, Palais Wilson, 1211 Geneva 14, Switzerland or, when applicable, to your Unesco Regional Office for Education (i.e. Bangkok, Dakar or Santiago).

INTERNATIONAL EDUCATIONAL REPORTING SERVICE

The principal aim of this service is to provide information about innovations which have a high relevance to developing countries. It will be designed to serve educational leaders in such countries, particularly those who decide policies and plan and administer education systems, so that they may be aware of the various possibilities open to them. Thus the IERS is seen as one instrument for helping in the renovation of national systems of education. It follows that the reports issued by the service will deal with subject areas of priority concern to developing countries. The emphasis lies on case materials about new ways of organizing the teaching and learning process which appear to lead to improved and wider educational opportunities without undue cost.

Although the IERS is placed in the IBE, it is taking shape as a network programme rather than a centralized operation. The Unesco Regional Offices for Education and the field programmes of Unesco as well as of Unicef, ILO and FAO are associated as partners in the service. Still more important, national institutions for educational information and research will be involved, to carry out studies and to supply and use the information, so that the network for exchange of innovatory experiences will be a reality.

The reporting service will become visible initially through a variety of documents such as indexes, abstracts, case studies, topic-centred papers and a newsletter; subsequently it is hoped to add non-print materials also. From the outset the IBE and Unesco Regional Offices wish to encourage requests for information, for it is by its response to the needs of users that the IERS will finally prove its value.

The IERS programme has been made possible through voluntary financial contributions to a special Unesco account by a number of international and bilateral agencies and national institutions. The seven donors at present are Unicef, the aid agencies of Canada, Sweden, the United Kingdom, the United States of America, the International Development Research Centre (Ottawa) and the Ford Foundation, who have offered support for a first period of three years.

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